WHAT IS CLAIMED IS:

1.   A method for classifying defects, comprising:

obtaining a defect image by taking a picture of a sample;

extracting a characteristic amount of defects from the defect image;

preparing at least one type of classification model which is a combination of rule-based classification and learning type classification to calculate the likelihood that the extracted defects belong to a classification class by using information on the extracted characteristic amount of the defects; and

classifying the defects of which characteristic amount is extracted by the at least one type of classification model.

2.   The method for classifying defects according to Claim 1, wherein the defect image obtained by taking the picture of the sample is an SEM image.

3.   The method for classifying defects according to Claim 1, wherein the defect image is obtained by taking a picture of the sample which is positioned with reference to position coordinate data on the defects of the sample.

4.   The method for classifying defects according to Claim 1, wherein the rule-based classification selects a particular classification class set from previously provided plural classification class sets on

a display screen.

5.   The method for classifying defects according to Claim 1, wherein a correlation among the previously determined classification classes, the classes determined by using the teach data and the classes determined by using the screen is analyzed in the step of generating the classification model to generate a classification model comprising a combination of those classes.

6.   The method for classifying defects according to Claim 1, wherein in the step of generating the classification model, the each classification model has a classification class, the class likelihood of the each classification class is calculated, the model likelihood about the adequacy of the each classification model is determined, and a class likelihood is decided according to the determined model likelihood.

7.   A method for classifying defects, comprising:

preparing at least one classification model which is comprised of a combination of plural classification means which are either a rule-based classification means for calculating a likelihood, belonging to previously determined classification classes, of a defect extracted from an image obtained by taking a picture of a sample according to a characteristic amount of the defect or a learning type classification means for calculating a likelihood, belonging to classification classes determined by using

teach data, of the defect; and

classifying the defect by using the prepared classification model.

8. The method for classifying defects according to Claim 7, wherein the learning type classification means is set on a display screen.

9. The method for classifying defects according to Claim 7, wherein the rule-based classification means is prepared by selecting a particular classification class set from previously provided plural classification class sets on a display screen.

10. The method for classifying defects according to Claim 7, wherein a correlation among the previously determined classification class, the class determined by using the teach data or the class determined on the screen is analyzed in the step of preparing at least one classification model, and a classification model comprised of a combination of those classes is generated.

11. The method for classifying defects according to Claim 7, wherein the each classification model has classification classes, calculates a class likelihood of the each classification class, determines a model likelihood about the adequacy of the each classification model and decides a class likelihood according to the determined model likelihood.

12. A method for classifying detects, comprising:

configuring at least one classification model

by combining plural classification means which are at least either a rule-based classification means for calculating a likelihood, belonging to previously determined classification classes, of a defect extracted from an image obtained by taking a picture of a sample according to a characteristic amount of the defect or a learning type classification means for calculating a likelihood belonging to plural classification classes determined on a display screen; and

classifying the defect by using the configured classification model.

13.   The method for classifying defects according to Claim 12, wherein the rule-based classification selects a particular classification class set from previously provided plural classification class sets on a display screen.

14.   The method for classifying defects according to Claim 12, wherein a correlation among the previously determined classification classes, the classes deter-mined by using the teach data or the classes determined on the screen is analyzed, and a classification model comprised of a combination of those classes is generated.

15.   The method for classifying defects according to Claim 12, wherein the each classification model has classification classes, calculates a class likelihood of the each classification class, determines a model

likelihood about the adequacy of the each classification model and decides a class likelihood according to the determined model likelihood.

16.   An apparatus for classifying defects, comprising:

plural types of classification model means which are comprised of a combination of a rule-based classification section for calculating a likelihood, belonging to previously determined classification classes, of a defect from an image obtained by taking a picture of a sample according to a characteristic amount of the defect and a learning type classification section for calculating a likelihood, belonging to the classification classes determined by using teach data, of the defect according to the characteristic amount of the defect; and

a defect classifying means for classifying the defect of which characteristic amount is extracted by a combination of the plural types of classification model means.

17.   The apparatus for classifying defects according to Claim 16, further comprising a display screen, wherein the learning type classification section sets a classification class by using the teach data on the display screen.

18.   The apparatus for classifying defects according to Claim 16, further comprising a display screen, wherein the configured classification model

means are shown on the display screen.

19.   The apparatus for classifying defects according to Claim 16, wherein the defect classifying means has a computing section for calculating a likelihood of each of the plural types of classification model means, and the defect classifying means classifies the defects by using information about the likelihood of the individual types of classification model means calculated by the computing section.

20.   The apparatus for classifying defects according to Claim 16, wherein the plural types of classification model means each have classification class sections, and the defect classifying means has a computing section for calculating the class likelihood of the individual classification class sections and model likelihood about the adequacy of the individual classification models to decide a class likelihood according to the model likelihood.

21.   An apparatus for classifying defects, comprising:

an imaging means for taking a picture of a sample;

a defect detecting means for detecting defects from the image obtained by taking the picture of the sample by the imaging means;

a characteristic amount extracting means for extracting a characteristic amount of the defects detected by the defect detecting means;

a rule-based classification apparatus for calculating a likelihood belonging to a classification class previously set according to the characteristic amount of the defects extracted by the characteristic amount extracting means;

a learning type classification apparatus for calculating a likelihood belonging to a classification class which is set by using teach data according to the characteristic amount of the defects extracted by the characteristic amount extracting means;

plural types of classification model means configured of a combination of the rule-based classification apparatus and the learning type classification apparatus; and

a defect classifying means for classifying the defects of which characteristic amount is extracted by a combination of the plural types of classification model means.

22. The apparatus for classifying defects according to Claim 21, further comprising a display screen, wherein the learning type classification apparatus sets classification classes by using teach data on the display screen.

23. The apparatus for classifying defects according to Claim 21, further comprising a display screen, wherein the configured classification model means are shown on the display screen.

24. The apparatus for classifying defects

according to Claim 21, wherein the defect classifying means has a computing section for calculating a likelihood of each of the plural types of classification model means, and the defect classifying means classifies the defects by using information about the likelihood of each of the individual types of classification model means calculated by the computing section.

25.　　　　The apparatus for classifying defects according to Claim 21, wherein the plural types of classification model means each have a classification class section, and the defect classifying means has a computing section which calculates a class likelihood of each of the classification class sections and a model likelihood about the adequacy of each of the classification models and decides a class likelihood according to the model likelihood.